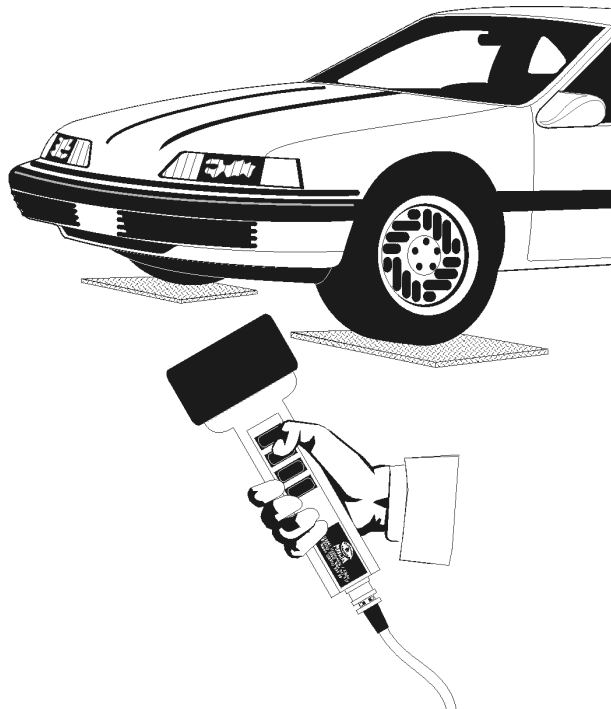


PMS / LMS

Axle Play Tester

for passenger cars up to 3.5 axle load
for commercial vehicles up to 20 t axle load



Standard Operating Procedure and User's Manual

Englisch/English

EDITION

Version 4 of the operating manual dated 21.10.1998
D1 0101BA1-GB04

© MAHA GMBH & Co. KG.

All rights reserved. Any reproductions of this document, partial or complete, are only allowed with prior consent of MAHA GmbH & Co. KG.

All rights reserved in cases of patent granting or registration of design.

The contents of this version have been checked with great care. However, errors cannot be fully excluded. Please contact MAHA should you find errors of any kind.
Subject to technical change without notice.

These instructions are intended for users with previous technical knowledge in the field of vehicle testing technology as well as basic computer knowledge and MS-Windows operating system application.

Windows and Windows for Workgroups is a registered trademark of the Microsoft-Corporation.

MANUFACTURER

MAHA Maschinenbau Haldenwang GmbH & Co. KG.
Hoyen 20
D-87490 Haldenwang/Allgäu

Telephone: 08374 / 585-0
Telefax: 08374/ 585-499

Internet: <http://www.maha.de>
e-mail: maha@maha.de

SERVICE

MAHA Maschinenbau Haldenwang GmbH & Co. KG.
- Service dept. -
Hoyen 20
D-87490 Haldenwang/Allgäu

Hotline: 08374 / 585 + extension
260 for brake testers, test lanes
280 for lifting technology
290 for performance testers, exhaust and air conditioning service equipment

Service: 08374 / 585-110 bis - 113, - 115
Telefax: 08374 / 585-491

TABLE OF CONTENTS

1	General Information	1
1.1	General	1
1.2	Safety Instructions	1
1.3	Specification.....	2
1.3.1	Mechanical Data.....	2
1.3.2	Electrical Data	2
1.4	Noise Emission	3
1.5	Safety Guidelines.....	3
1.6	List of Models.....	4
2	Operations	9
2.1	Operations PMS/LMS	9
2.2	Operations PMS 101/LMS 101	10
3	Maintenance	11
3.1	Maintenance	11
3.2	Installation of Control Unit.....	11
4	Appendix A	13
4.1	Maintenance Plan	13

1 General Information

1.1 General

The electro-hydraulic test stand **PMS** or **LMS** is designed to test vehicle axles and their components for possible wear and tear due to extensive use

Two tests plates, integrated into the floor or into a scissor-type lifting platform, are controlled in their forward and sideward movements by switches on the portable lamp.

Worn track-rod ends, ball joints, wheel-bearing play and many other defects are immediately detectable during the cross and longitudinal movements of the test plates.

The axle play tester facilitates a reliable test even for large and heavy vehicles where a possible wheel-bearing play could hardly be detected by manual shaking, which was common practice in the past.

Another advantage of this test stand is its smooth one-handed operation without using a pit lifting device.

1.2 Safety Instructions



Safety Instructions are provided to warn about dangerous situations and to help avoid injury to people.

- ♦ The machinery is only to be used for its **intended purpose** as described in the operating instructions!
- ♦ Only **trained authorized personnel** may operate the test stand.
- ♦ **All work on electrical parts** of the equipment is to be carried out by **trained, qualified electricians or service technicians only**.



For safe operation pay attention to the following:

- ♦ **Read the standard operating procedures and user`s manual thoroughly!** MAHA will not accept and is not liable for any claims for damage or service costs incurred due to non-compliance with these operating instructions.
- ♦ **All official Accident Prevention Regulations must be thoroughly complied with!**

- ♦ Test plates in operation are potentially dangerous!
- ♦ Emergency procedures to be followed when coming into contact with hydraulic oil (Safety Sheet DIN 52900, excerpt):
 - Skin** ⇒ Thoroughly wash all skin areas with soap and water which have come into contact with oil.
 - Eyes** ⇒ Rinse the eyes with clear water for at least 10 minutes! Eventually a doctor should be contacted.
 - Swallowing** ⇒ **Do not induce vomiting!** Give the patient approx. 25 to 50 g medical carbon and 5 to 10 g paraffinum liquidum.

1.3 Specification

1.3.1 Mechanical Data

	Commercial vehicle	Passenger car
Total max. axle load	20 t 18 t (LMS 101)	3,5 t
Max. axle load per side	10 t 9 t (LMS 101)	1,75 t
Max. movement per side	100 mm	100 mm
Oil capacity of ,hydraulic unit	approx. 8,5 l hydraulic oil SAE 5	
Size	750 x 750 mm	625 x 625 mm
Installation height	220 mm	134 mm
Height above floor	232 mm	150 mm
Max. thrust per side	30000 N	11000 N
Max. pressure of hydraulic unit per side	120 bar	120 bar
	Pressure relieve valve included.	

1.3.2 Electrical Data

	Commercial vehicle	Passenger car
Power supply	400 V, 3 phases	
Fuse	16 A slow	16 A slow
Cable	5 x 1,5 mm ²	5 x 1,5 mm ²
Portable lamp	Halogen 12 V, 20 W	
Control	24 V in portable lamp	
Electric solenoid valves	24 V	24 V

The test stand is remotely controlled via a hand lamp which is equipped with various pushbuttons. The portable lamp is available in two different versions, either with cable remote control (standard equipment) or with infrared transmitter.

Technical Data Infrared Lamp

Halogen-illuminant
Illuminated area approx. 1200 m
Luminescence approx. 60 min.
Weight appr. 750 g
Halogen lamp 4,8 V; 4,4 W
Screwed socket
Charging box
Batteries: 4 NiCd Sub C-size

Technical Data Cable Lamp

Halogen-illuminant
Illuminated area approx. 1200m
Gewicht ca. 750 g
Halogen lamp 12V; 20 W
Plug-in socket
Length of cable 7,5 m

Subject to technical alterations without notice!

1.4 Noise Emission

The noise emission value created when the tester is in operation is less than 70 dB (A) in the work area of the operational personnel.

1.5 Safety Guidelines

The following points were taken into consideration at construction:

- ♦ The test stand meets the safety demands of the following guidelines:
 - 89/392/EWG in connection with 91/368/EWG and 93/44/EWG EG-Machinery guidelines.
 - 73/23/EWG EG-Low Voltage guidelines.
 - 89/336/EWG EG -guidelines regarding electro-magnetic tolerance.

CE-Declaration of Conformity .

Pay attention during operation:

- ♦ The Accident Prevention Regulations of the country in which the lift is being operated apply.
- ♦ The following guidelines apply within the European Union countries:
 - 89/391/EWG Safety and Health Protection for the Employee.
 - 89/654/EWG Safety and Health Protection in the Work Area.
 - 89/655/EWG Safety and Health Protection when using Working Materials.
 - 89/656/EWG Safety and Health Protection when using personal Protective Clothing.
 - 92/58/EWG Safety and/or Health Protection Identification at the Place of Work

1.6 List of Models

The axle play tester of MAHA Maschinenbau Haldenwang is available in many options. The difference in these options is mainly the sequence of movements of the test plates, the design and the use of pushbuttons on the portable lamp.

The following drawings will show various pushbutton assignments on the portable lamp, but are by no means complete.

The portable lamp is available in two different versions, either with cable remote control or with infrared transmitter. The PMS/LMS 101 version is directly operated via a lever and a portable lamp.

The test stand is operated via toggle switches on the portable lamp which have, depending on the version, various functions. They facilitate, e.g. the control of longitudinal/cross and diagonal movements of the test plates.

The portable lamp is on or disabled by one of the switches.

As soon as the test plates are in operation, the hydraulic control unit enables automatically.

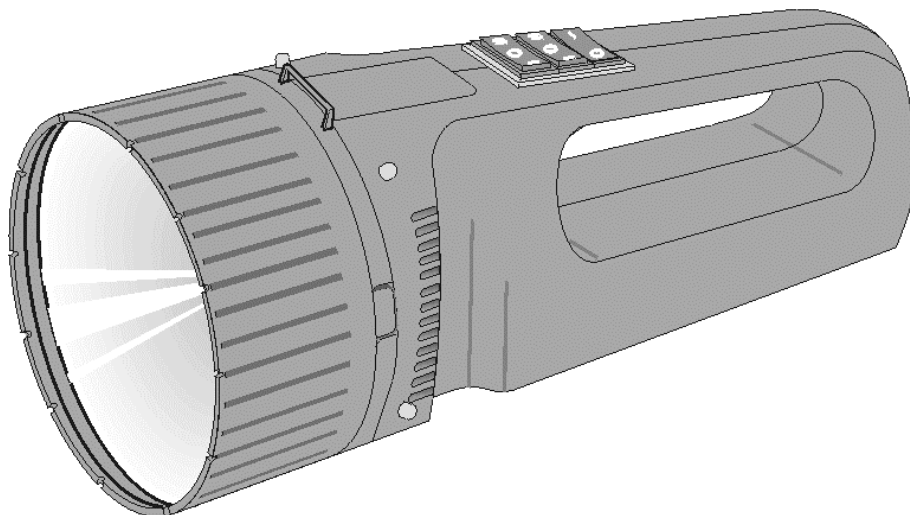
The hydraulic control unit is equipped with an automatic cut-off which is set at approx. 7 sec; after this time has elapsed with no switch having been actuated within this time, the hydraulic control unit switches off.

As an option, the portable lamp is also available with an infrared transmitter.



When not in use, the infrared lamp should always be placed in the charging box with the reflector on top!

The accumulator-charging period of the lamp is approx. 14 hours. A LED will blink on the recharging box indicating that the battery is recharged properly.



Infrared lamp

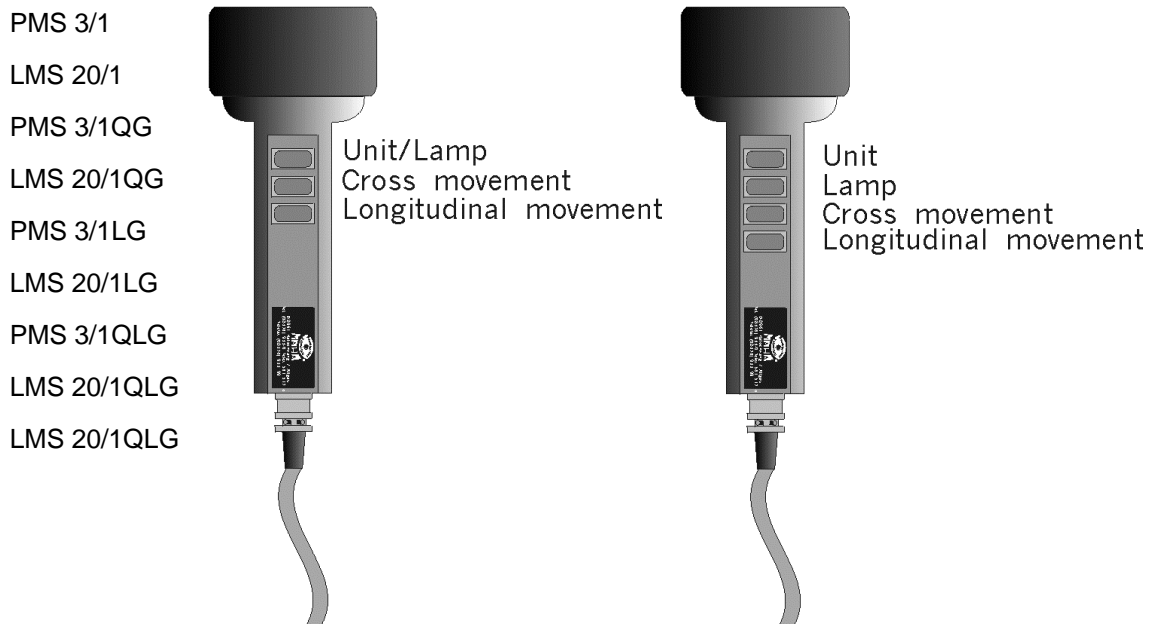


Only 4.5 W halogen bulbs should be used with the infrared portable lamp, otherwise the longevity of the accumulator can be substantially reduced.

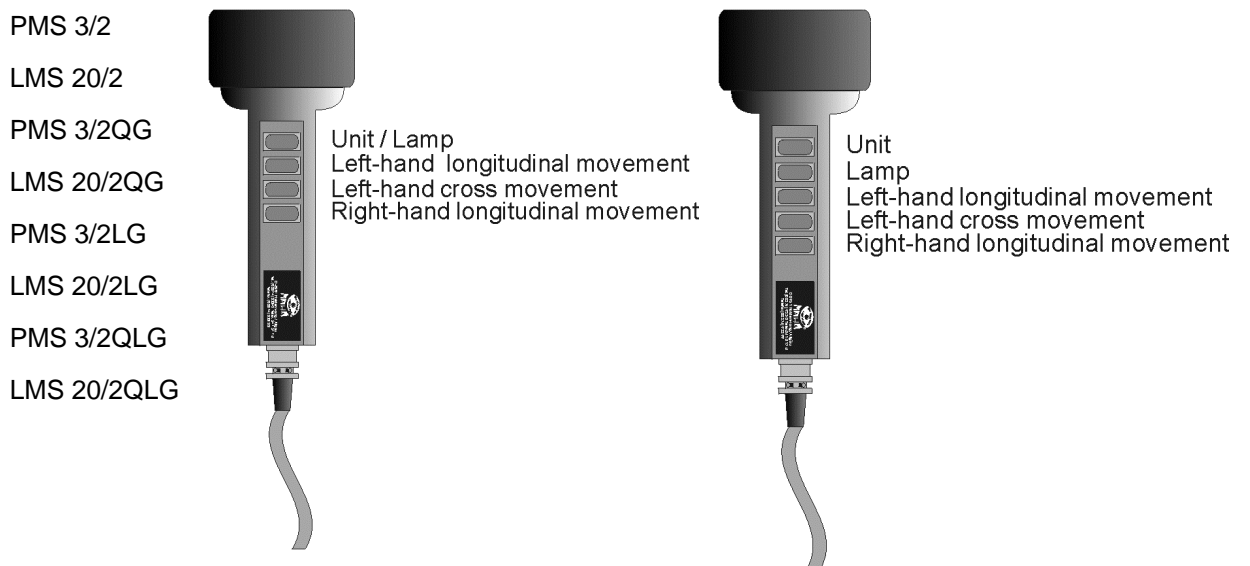


Used nickel-cadmium cells and defective instruments should be disposed off at special waste depots!

The following pushbutton functions also apply for infrared lamps:



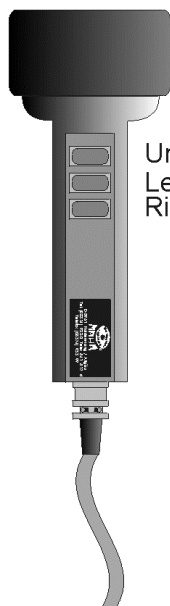
The following test stands are equipped with a synchronizing switch to synchronize the longitudinal and cross movements which are normally opposite.



The following test equipment may be installed in MAHA DUO lifting platforms:

PMS 3/2S

PMS 3/2SH



Unit/Lamp
Left-hand cross movement
Right-hand cross movement



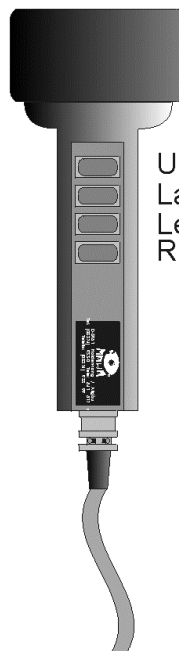
Unit
Lamp
Left-hand diagonal movement
Right-hand diagonal movement

PMS 3/2D

PMS 3/2DH



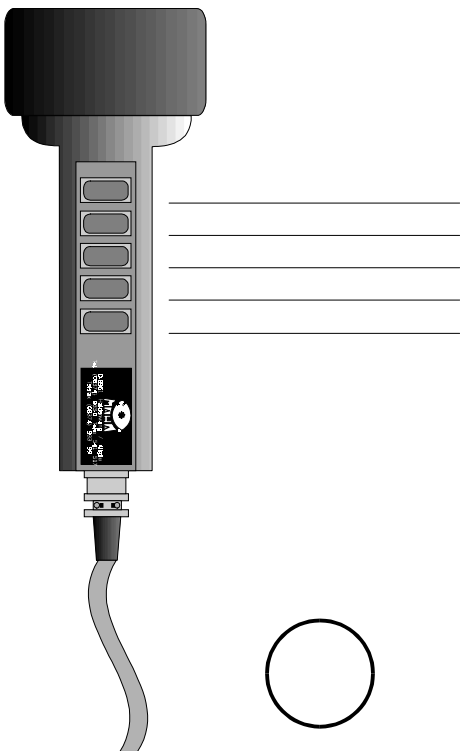
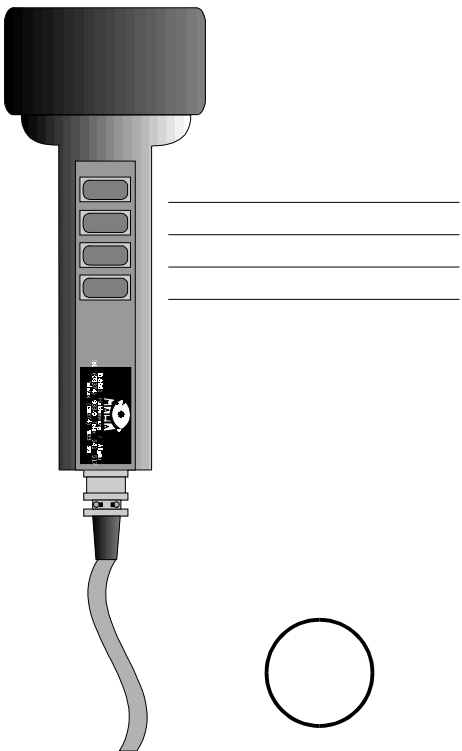
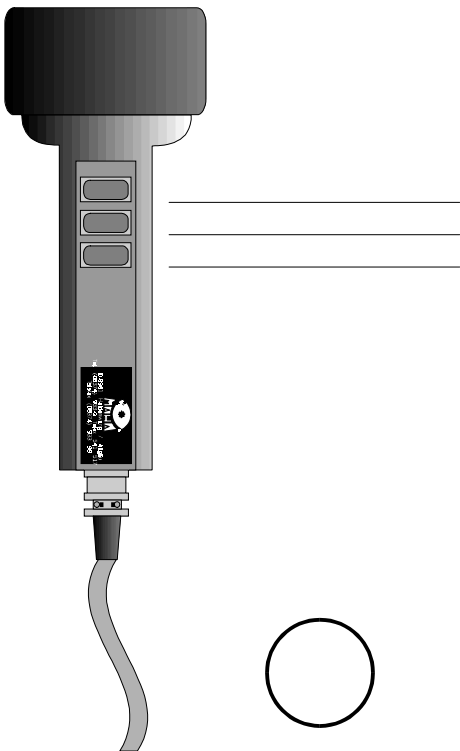
Unit/Lamp
Left-hand diagonal movement
Right-hand diagonal movement



Unit
Lamp
Left-hand cross movement
Right-hand cross movement

The following configuration applies to this test stand:

Service technicians should identify the test lamp in question on this page and enter the applicable push button configuration.



- ☐ Synchronization switch for cross movement
- ☐ Synchronization switch for longitudinal movement
- ☐ Lamp with infrared remote control
- ☐ Options:

2 Operations

2.1 Operations PMS/LMS

- ♦ Enable test stand by mains switch.
- ♦ Drive vehicle onto test plates.
- ♦ Operate test plates by pushbutton functions of the portable lamp as described in Chapter 1, Page 6.



Do not run hydraulic unit longer than absolutely necessary, as this may cause damage to the pump!

- ♦ Some axle play testers are equipped with a synchronizing switch on the control panel, to control longitudinal and/or cross movement of the plates.



Operate brake in case of plate movement in driving direction, forward and reverse, as this movement might be repeated by the rotating wheels.

After termination of the test, switch off lamp and hydraulic unit by the toggle switch on the portable lamp.

Drive vehicle from test plates.

Place portable lamp in the charging box when not in use.

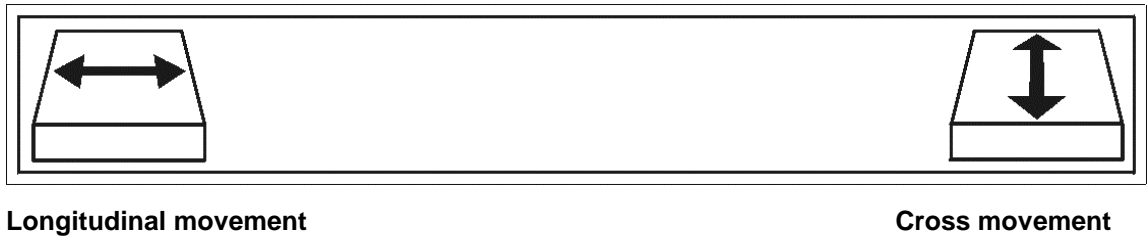


Attempt to make the vehicle wheels slip on the plates, as this will facilitate testing for unacceptable play

Protect portable lamp against impacts to extend the life of its bulb.

2.2 Operations PMS 101/LMS 101

On PMS 101 and LMS 101 axle play testers, the moving direction of the test plates is controlled via a hand lever. The hand lever can have the following two positions:



The hand lever is located at the test plates.

The remote control portable lamp is equipped with two toggle switches. The first toggle switch has two switch positions, 0 and I, which en-or disable the lamp. The second toggle switch with switch positions I, 0 and II facilitates the control of longitudinal and cross movement of the test plates.

3 Maintenance

3.1 Maintenance

Remove covers every 200 operating hours or at least every three months and grease guideways with a grease gun. Check guide rod bolts for tightness. Retighten if necessary.

Regularly check the oil level in the hydraulic tank. The oil level should be between the two marks.

Change hydraulic oil every two years. Use approximately 8,5 l HLPD 32 hydraulic oil. Refer to maintenance plan, appendix A.



If the sliding cylinder or the guide rod need to be replaced, the attachment screws must be glued in with Loctite 243!

3.2 Installation of Control Unit

Authorized service technicians have special documents (e.g. pit plans) at their disposal for the installation and dismantling of the PMS/LMS.

The axle play tester PMS/LMS may only be installed by qualified technicians!



All work on electrical parts of the equipment is to be carried out by trained qualified electricians or service technicians of the manufacturer or its dealers only!



MAHA warranty coverage does not apply to damage caused by improper installation or dismantling. This regulation will also apply during the regular warranty period.

4 Appendix A

4.1 Maintenance Plan

